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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Skene et al.	Examiner:	Not Assigned
Application No.:	09/788,281	Group Art Unit:	2151
Filed:	February 16, 2001	Docket No.:	50002.02USI1
Title:	METHOD AND SYSTEM FOR BALANCING LOAD DISTRIBUTION ON A WIDE AREA NETWORK		

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By: _____
Name: Timothy P. Sullivan

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Prior to examination on the merits, please amend the above-entitled application as follows:

In the Claims

Please cancel Claim 1.

Please add new Claims 2-48.

--2. (New) A method of bridging disparate content delivery networks (CDNs) across a plurality of zones within a network, comprising:

receiving a request from a client located within one of the plurality of zones for access to resources associated with a domain name;

determining network conditions for the network based on a determination of the load for each of the plurality of zones;

OIPE
MAY 24 2001
PATENT & TRADEMARK OFFICE

distributing the request to one of the plurality of zones based on the determined network conditions;

selecting one of the plurality of servers within the zone in which the request was distributed, the selection of the server being based on a determination for optimally balancing the load across the plurality of servers; and

resolving an Internet protocol (ip) address of the selected server so that the accessing of resources associated with the domain name at the resolved ip address of the selected server will bridge CDNs.

3. (New) The method of claim 3, further comprising querying a local Domain Name System (DNS) to provide the ip address associated with the domain name.

4. (New) The method of claim 3 wherein when the ip address is not present at the local DNS, querying a primary DNS to resolve the ip address associated with the domain name.

5. (New) The method of claim 4, wherein when the primary DNS determines the domain name is delegated to a EDNS, further comprises referring the local DNS to the EDNS to resolve the ip address for the selected server, the EDNS employs at least one of a plurality of load balancing determinations to select one of the plurality of servers and resolve the ip address for the selected server.

6. (New) The method of claim 5 wherein selecting one of the plurality of servers, further comprises choosing the server based on one of a plurality of static load balancing determinations for each server, the plurality of static load balancing determinations being selectable and including random, round robin, static ratio, global availability and topology.

7. (New) The method of claim 5 wherein selecting one of the plurality of servers, further comprises choosing the server based on one of a plurality of dynamic load balancing determinations for each server, the dynamic load balancing determinations being selectable and including completion rate, least connections, packet rate, hops, round trip times, new connection rate, kilobyte rate, quality of service and dynamic ratio.

8. (New) The method of claim 5 wherein selecting one of the plurality of servers, further comprises:

marking each of a plurality of pools to a not tried state;

determining a pool load-balancing setting;

selecting one of the plurality of pools that is marked to the initialization state;

marking the selected one of the plurality of pools to a tried state;

attempting to obtain an answer using the determined pool load-balancing on the selected one of the plurality of pools;

determining if the answer was obtained.

9. (New) The method of claim 5 wherein selecting one of the plurality of servers, further comprises accounting for computing power behind a wide are virtual server.

10. (New) The method of claim 2, further comprising identifying a proximity of the request; and distributing the request based on the proximity.

11. (New) The method of claim 10 wherein identifying the proximity of the request further comprises determining a geographic location of the request.

12. (New) The method of claim 11, further comprising, creating a topology that maps the request to the geographic location.

13. (New) The method of claim 12 wherein distributing the request based on the proximity further comprises, distributing the request to a closest server based on a closest identified geographic CONTENT-SERVER or a best-performing CONTENT-SERVER, or a best quality path.

14. (New) The method of claim 11 wherein determining the geographic location of the request, further comprises:

gathering metric information; and

using the metric information to determine the geographic location of the request.

15. (New) The method of claim 14 wherein gathering the metric information further comprises, gathering the metric information using active probing.

16. (New) The method of claim 14 wherein gathering the metric information further comprises, gathering the metric information using passive probing.

17. (New) The method as in claim 14 wherein gathering the metric information further comprises deriving cost metrics for network paths in topological maps.

18. (New) The method of claim 11 wherein determining the geographic location of the request, further comprises using a last hop address to determine the geographic location of the request.

19. (New) The method of claim 2, further comprising using a last-resort pool to select the server.

20. (New) The method of claim 2, wherein at least a portion of the plurality of servers are virtual servers.

21. (New) The method of claim 20 wherein selecting one of the plurality of servers within the zone in which the request was distributed, the selection of the server being based on a determination for optimally balancing the load across the plurality of servers, further comprising:

determining if the selected server is a virtual server, and if so:

determining a number of nodes up on the virtual server;

determining if the number of nodes up or the number of connections for the virtual server exceeds a predetermined number and if so returning a value indicating the capacity of the virtual server has been exceeded.

22. (New) A system for balancing the load on a plurality of virtual servers that provide access to resources associated with a domain name, comprising:

a memory for storing logical instructions; and

a processor for executing the logical instructions stored in the memory, the execution of the logical instructions causing functions to be performed, including:

receiving a request from a client located within one of the plurality of zones for access to resources associated with a domain name through an authoritative server;

determining network conditions for the network based on a determination of the load for each of the plurality of zones;

distributing the request to one of the plurality of zones based on the determined network conditions;

selecting one of the plurality of servers within the zone in which the request was distributed, the selection of the server being based on a determination for optimally balancing the load across the plurality of servers; and

resolving an Internet protocol (ip) address of the selected server so that the accessing of resources associated with the domain name at the resolved ip address of the selected server will bridge CDNs.

23. (New) The system of claim 22, wherein selecting one of the plurality of servers, further comprises choosing the server based on one of a plurality of static load balancing determinations for each server, the plurality of static load balancing determinations being selectable and including random, round robin, static ratio, global availability and topology.

24. (New) The system of claim 22 wherein selecting one of the plurality of servers, further comprises choosing the server based on one of a plurality of dynamic load balancing determinations for each server, the dynamic load balancing determinations being selectable and including completion rate, least connections, packet rate, hops, round trip times, new connection rate, kilobyte rate, quality of service and dynamic ratio.

25. (New) The system of claim 22 wherein selecting one of the plurality of servers, further comprises:

marking each of a plurality of pools to a not tried state;

determining a pool load-balancing setting;

selecting one of the plurality of pools that is marked to the initialization state;

marking the selected one of the plurality of pools to a tried state;

attempting to obtain an answer using the determined pool load-balancing on the selected one of the plurality of pools;

determining if the answer was obtained.

26. (New) The system of claim 22 wherein selecting one of the plurality of servers, further comprises accounting for computing power behind a wide are virtual server.

27. (New) The system of claim 22, further comprising:

determining a geographic location of the request;

identifying a proximity of the request based on the geographic location; and

distributing the request based on the proximity.

28. (New) The system of claim 27, further comprising creating a topology that maps the request to the geographic location.

29. (New) The system of claim 28 wherein distributing the request based on the proximity further comprises distributing the request to a closest server based on a closest identified geographic CONTENT-SERVER or a best-performing CONTENT-SERVER, or a best quality path.

30. (New) The system of claim 27 wherein determining the geographic location of the request further comprises:

gathering metric information; and

using the metric information to determine the geographic location of the request.

31. (New) The system of claim 30 wherein gathering the metric information further comprises gathering the metric information using active probing.

32. (New) The system of claim 31 wherein gathering the metric information further comprises gathering the metric information using passive probing.

33. (New) The system as in claim 32 wherein gathering the metric information further comprises deriving cost metrics for network paths in topological maps.

34. (New) The system of claim 27 wherein determining the geographic location of the request further comprises using a last hop address to determine the geographic location of the request.

35. (New) The system of claim 22, further comprising using a last-resort pool to select the server.

36. (New) The system of claim 22 wherein at least a portion of the plurality of servers are virtual servers.

37. (New) The system of claim 36 wherein selecting one of the plurality of servers within the zone in which the request was distributed, the selection of the server being based on a determination for optimally balancing the load across the plurality of servers further comprising:

determining if the selected server is a virtual server, and if so:

determining a number of nodes up on the virtual server;

determining if the number of nodes up or the number of connections for the virtual server exceeds a predetermined number and if so returning a value indicating the capacity of the virtual server has been exceeded.

38. (New) A modulated data signal embodied in a carrier wave and representing computer executable instructions for bridging disparate content delivery networks (CDNs) across a plurality of zones within a network, comprising:

receiving a request from a client located within one of the plurality of zones for access to resources associated with a domain name;

determining a geographic location of the request;

determining network conditions for the network;

distributing the request to one of the plurality of zones based on the geographic location and network conditions;

selecting one of the plurality of servers within the zone in which the request was distributed, the selection of the server being based on a determination for optimally balancing the load across the plurality of servers; and

resolving an Internet protocol (ip) address of the selected server so that the accessing of resources associated with the domain name at the resolved ip address of the selected server will bridge CDNs.

39. (New) The modulated data signal of claim 38 wherein selecting one of the plurality of servers further comprises choosing the server based on one of a plurality of static load balancing determinations for each server, the plurality of static load balancing determinations being selectable and including random, round robin, static ratio, global availability and topology.

40. (New) The modulated data signal of claim 38 wherein selecting one of the plurality of servers further comprises choosing the server based on one of a plurality of dynamic load balancing determinations for each server, the dynamic load balancing determinations being selectable and including completion rate, least connections, packet rate, hops, round trip times, new connection rate, kilobyte rate, quality of service and dynamic ratio.

41. (New) The modulated data signal of claim 38, further comprising:

determining a geographic location of the request;

identifying a proximity of the request based on the geographic location; and

distributing the request based on the proximity.

42. (New) The modulated data signal of claim 41, further comprising, creating a topology that maps the request to the geographic location.

43. (New) The modulated data signal of claim 41 wherein determining the geographic location of the request further comprises:

gathering metric information; and

using the metric information to determine the geographic location of the request.

44. (New) The modulated data signal of claim 43 wherein gathering the metric information further comprises gathering the metric information using active or passive probing.

45. (New) The modulated data signal of claim 41 wherein determining the geographic location of the request further comprises using a last hop address to determine the geographic location of the request.

46. (New) The modulated data signal of claim 38, further comprising using a last-resort pool.

47. (New) The modulated data signal of claim 38 wherein at least a portion of the plurality of servers are virtual servers.

48. (New) The modulated data signal of claim 47 wherein selecting one of the plurality of servers within the zone in which the request was distributed, the selection of the server being based on a determination for optimally balancing the load across the plurality of servers further comprising:

determining if the selected server is a virtual server, and if so:

determining a number of nodes up on the virtual server;

determining if the number of nodes up or the number of connections for the virtual server exceeds a predetermined number and if so returning a value indicating the capacity of the virtual server has been exceeded.--

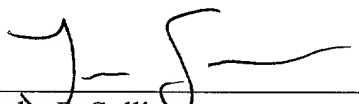
OIPE JC185
MAY 24 2001
PATENT & TRADEMARK OFFICE

REMARKS

This preliminary amendment is submitted to further define the invention. No new matter is added. Applicants respectfully request the entry of this preliminary amendment.

Respectfully submitted,

MERCHANT & GOULD P.C.



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O I P E JC165
MAY 24 2001
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Claim 1 has been canceled.

New claims 2-48 have been added.